

ADMINISTRATIVE MESSAGE

ROUTINE

R 141200Z SEP 98 ZYB

FM NAVOBSY WASHINGTON DC//IT//

TO CINCPACFLT PEARL HARBOR HI//JJJ//
 CINCLANTFLT NORFOLK VA//JJJ//
 CMC WASHINGTON DC//JJJ//
 CINCUSNAVEUR LONDON UK//JJJ//
 HQ COGARD WASHINGTON DC//JJJ//
 USARSPACE COLORADO SPRINGS CO//JJJ//
 COMNAVSPACECOM DAHLGREN VA//JJJ//
 COMAFSPACECOM PETERSON AFAB CO//JJJ//
 NIMA HQ BETHESDA MD//JJJ//
 NRL WASHINGTON DC//JJJ//
 DIRNSA FT GEORGE G MEADE MD//JJJ//
 NAVDEPNOAA WASHINGTON DC//JJJ//

INFO CNO WASHINGTON DC//N3/N5/N6/N096/N6Y2K//
 DONCIO WASHINGTON DC//N0001//
 COMNAVMETOCCOM STENNIS SPACE CTR MS//JJJ//

UNCLAS //N02000//

MSGID/GENADMIN/USNO//

SUBJ/FORMAT OF MISSION CRITICAL TIME AND ASTRONOMICAL DATA PROVIDED
 /BY NAVOBSY AFTER Y2K//
 POC/LT HEINER/USNO/WASHINGTON DC/-/TEL:DSN 762-1537
 /TEL:COMM 202-762-1537//

RMKS/1. READD AS DEEMED NECESSARY.

2. FORMAT OF ALL DATA PROVIDED BY NAVOBSY WITH THE EXCEPTION OF
 DATA PROVIDED TO GPS MASTER CONTROL STATION (GPS MCS) WILL NOT
 CHANGE FOR Y2K. NAVOBSY AND GPS MCS HAVE BEEN COORDINATING NECESSARY
 FORMAT CHANGES IAW NAVOBSY AND GPS MCS ICD, ICD-GPS-202. NAVOBSY'S
 FORMATS OF Y2K COMPLIANT DATA FOR GPS MCS ARE DESCRIBED BELOW IN #4.
 THE VAST MAJORITY OF NAVOBSY SUPPLIED DATA HANDLES DATES USING THE
 JULIAN DATE NUMBER (JD) AND MODIFIED JULIAN DATE (MJD). THESE DATES
 CONTINUE AS UNINTERRUPTED DAY COUNTS FOR Y2K.

3. DOD STANDARDIZED DATA FORMATS WITHIN PRODUCTS THAT PROVIDE
 PREDICTED POSITIONS OF CELESTIAL OBJECTS - NAUTICAL ALMANAC, AIR
 ALMANAC, ASTRONOMICAL ALMANAC, ASTRONOMICAL PHENOMENA, MULTIYEAR
 INTERACTIVE COMPUTER ALMANAC (MICA), SYSTEM TO ESTIMATE LATITUDE
 AND LONGITUDE ASTRONOMICALLY (STELLA), SOLAR LUNAR ALMANAC CORE
 (SLAC) SOFTWARE, EPHEMERIDES, STAR CATALOGS RECOMMENDED FOR
 ASTROMETRIC APPLICATIONS, ACT-AC-TYCHO CATALOG, AC2000, USNO A1,
 A2, SA1, AND SA2, WASHINGTON DOUBLE STAR CATALOG, WASHINGTON
 ORBIT STAR CATALOG, RADIO REFERENCE FRAME IMAGE DATABASE,
 OPTICAL IMAGE DATABASE, PARALLAX CATALOGS, TRANSIT CIRCLE
 OBSERVATIONAL CATALOGS, HIPPARCOS CATALOG, ASTROGRAPHIC CATALOG -
 WILL NOT CHANGE FOR Y2K. THESE HARDCOPY AND SOFTWARE PRODUCTS
 HAVE BEEN OR WILL BE PRODUCED FOR THE YEAR 2000 AND BEYOND AND
 THEIR DATA FIELDS HAVE NOT AND WILL NOT CHANGE.

4. PRECISE TIME AND TIME INTERVAL DATA PROVIDED BY NAVOBSY WITH THE

EXCEPTION OF DATA DELIVERED TO GPS MCS WILL NOT CHANGE FOR Y2K.
 CHANGES IN TIME DATA FORMAT SENT TO GPS MCS WILL BE FULLY IMPLEMENTED
 NLT 31 DEC 98. THE FOLLOWING GPS MCS DATA FORMAT CHANGES FOR
 "NAVOBSY PPS DATA - P CODE L1/L2" WILL OCCUR:

FOR THE DATA FILE TITLED "USNO GPS TRACKING DATA REDUCED (UT)":
 THE COLUMN LABELED "MID PASS"

DOY
 WILL HAVE 7 DIGITS THEN A PERIOD THEN 5 DIGITS, E.G. 1998181.55466
 VICE THE CURRENT CORRESPONDING FORMAT OF 98181.55466
 THE REMAINING COLUMNS' FORMATS WILL NOT CHANGE. TABLES WILL CONTINUE
 TO APPEAR AS ILLUSTRATED BELOW. FOR BREVITY SAKE ONLY TWO ROWS OF
 DATA ARE ILLUSTRATED. ALL VALUES BELOW ARE EXAMPLE VALUES.

| SVN | MID PASS | BGTK | GPS-MC | SLOPE | RMS | SAMP | SVCLK-MC | SLOPE | ** |
|-----|---------------|------|--------|-------|-----|------|----------|-------|-----|
| | DOY | HHMM | NS | PS/S | NS | N | NS | PS/S | NS |
| 13 | 1998181.55466 | 1312 | -15 | -16 | 5 | 130 | -503877 | -20 | -15 |
| 37 | 1998181.56647 | 1329 | -14 | 6 | 2 | 130 | 782669 | 10 | -14 |

FOR THE DATA FILE TITLED "TWO-DAY SMOOTHED GPS-UTC (USNO-MC) VALUES":
 THE COLUMN LABELED "DOY"

WILL HAVE 7 DIGITS THEN A PERIOD THEN A ZERO, E.G. 1998167.0
 VICE THE CURRENT CORRESPONDING FORMAT OF 98167.0
 THE REMAINING COLUMNS' FORMATS WILL NOT CHANGE. TABLES WILL CONTINUE
 TO APPEAR AS ILLUSTRATED BELOW. FOR BREVITY SAKE ONLY TWO ROWS OF
 DATA ARE ILLUSTRATED. ALL VALUES BELOW ARE EXAMPLE VALUES.

| | MJD | DOY | GPS-UTC | SLOPE | SIGMA |
|---------|-----------|------|---------|-------|-------|
| | | | NS | NS/D | NS N |
| 50980.0 | 1998167.0 | 5.35 | 2.04 | 5.97 | 160 |
| 50981.0 | 1998168.0 | 7.08 | 1.86 | 6.23 | 165 |

FOR THE DATA FILE TITLED "ONE-DAY FILTERED AVERAGE ERROR: UTC (VIA
 GPS) - UTC (USNO MC)":

THERE WILL BE A NEW ORDER OF COLUMNS TO INCLUDE AN ADDITIONAL
 COLUMN. THE CURRENT ORDER OF COLUMNS APPEARS AS:

| | MDS | DOY | GPS-UTC | AVGERR | NS | N | SIGMA |
|--|-----|-----|---------|--------|----|---|-------|
|--|-----|-----|---------|--------|----|---|-------|

THE NEW ORDER OF COLUMNS WILL APPEAR AS (WITH TWO ROWS OF EXAMPLE
 DATA):

| | MJD | DOY | UTC (GPS)- | UTC (USNO) | AVGERR | SIGMA | RMS |
|-------|----------|------|------------|------------|--------|-------|-----|
| | | | NS | NS | NS | NS | N |
| 50965 | 19988152 | 1.92 | 6.53 | 6.80 | 84 | | |
| 50966 | 1998153 | -.80 | 5.82 | 5.87 | 85 | | |

THESE NEW COLUMNS WILL HAVE THE FOLLOWING DATA FORMATS:

| | | |
|------------|---|---|
| MJD | : | 5 DIGIT INTEGER |
| DOY | : | 7 DIGIT INTEGER |
| UTC (GPS)- | | |
| UTC (USNO) | | |
| AVGERR | | |
| NS | : | FLOATING POINT NUMBER WITH 2 DIGITS FOLLOWING THE DECIMAL POINT |
| SIGMA | | |
| NS | : | FLOATING POINT NUMBER WITH 2 DIGITS FOLLOWING THE DECIMAL POINT |
| RMS | | |
| NS | : | FLOATING POINT NUMBER WITH 2 DIGITS FOLLOWING THE DECIMAL POINT |
| N | : | 2 DIGITS INTEGER |

5. FORMAT OF CLOCK PHASE DATA SENT TO BIPM WILL NOT CHANGE. THIS
 DATA'S FILES WILL STILL BE COMPOSED OF 6 INTEGER COLUMNS. FIRST
 COLUMN HOLDS 17 DIGITS - FIRST 5 DIGITS = MJD, NEXT 5 DIGITS =

NAVOBSY'S CODE, LAST 7 DIGITS - CLOCK CODE. COLUMNS 2 THROUGH 5 HOLD UP TO 13 DIGITS PLUS A POSSIBLE NEGATIVE SIGN. THE LATTER 7 DIGITS INDICATE CLOCK CODES AND THE VARYING LNUMBER OF BEGINNING (LEFT-MOST)DIGITS REPRESENT PHASE DATA. THE LAST COLUMN IS ALSO PHASE DATA.

6. FORMAT OF NAVOBSY'S DAILY TIME DIFFERENCES SERIES 4 AND SERIES 5 DATA WILL NOT CHANGE. SERIES 4 PAGE ONE DATA TITLED, "UTC (USNO MC) - TRANSMITTING STATION", WILL STILL HAVE THE SAME DATA TABLES AND THE VALUES' FORMATS WILL REMAIN THE SAME. TABLES WILL CONTINUE TO APPEAR AS ILLUSTRATED BELOW. FOR BREVITY SAKE ONLY TWO ROWS OF DATA PER TABLE ARE ILLUSTRATED. ALL VALUES BELOW ARE EXAMPLE VALUES.

| | MJD | LC 5930 | LC 7960 | LC 7980 | LC 8290 | LC 8970 | LC 9610 |
|-------|-------|---------|---------|---------|---------|---------|---------|
| | | EC CAN | GULF AK | SE US | NC US | G LAKES | SC US |
| SEP 7 | 50698 | -70 | -40 | -160 | 150 | 40 | -270 |
| SEP 8 | 50699 | -90 | -20 | -130 | 140 | 130 | -340 |

| | MJD | LC 9940 | LC 9960 | LC 9990 | GPS | GLONASS |
|-------|-------|---------|---------|---------|-------|---------|
| | | WC US | NE US | N PAC | 2-DAY | 2-DAY |
| SEP 7 | 50698 | 150 | 60 | -110 | -9 | -294 |
| SEP 8 | 50699 | 130 | 50 | -110 | -9 | -292 |

INTERNATIONAL ATOMIC TIME (TAI) IS AHEAD OF UTC BY 31 SECONDS

INTERNATIONAL ATOMIC TIME (TAI) IS AHEAD OF GPS BY 19 SECONDS

SERIES 4 REMAINING DATA TITLED:

GLOBAL POSITIONING SYSTEM (GPS)

USNO COMMON VIEW DATA

WILL STILL INCLUDE THE SAME DATA TABLES AND THE VALUES' FORMATS WILL REMAIN THE SAME. TABLES WILL CONTINUE TO APPEAR AS ILLUSTRATED BELOW. AGAIN, FOR BREVITY SAKE ONLY TWO ROWS OF ONE TABLES' DATE ARE ILLUSTRATED. THIS FILE CONTAINS AND WILL CONTINUE TO CONTAIN 8 IDENTICALLY FORMATTED TABLES ILLUSTRATING TIME ACCURACY OF GPS SATELLITES. ALSO, THE LAST COLUMN HAS BEEN OMITTED FROM THE TABLE BELOW DUE TO CHARACTERS PER LINE RESTRICTIONS IN NAVAL MESSAGES. ALL VALUES BELOW ARE EXAMPLE VALUES.

| | SEP 7 | SEP 8 | SEP 9 | SEP 10 | | | | | |
|-----|-----------|-----------|-----------|-----------|-------|--------|-------|--------|--------|
| | MJD 50698 | MJD 50699 | MJD 50700 | MJD 50701 | | | | | |
| SVN | PRN | MC-GPS | UTC | MC-GPS | UTC | MC-GPS | UTC | MC-GPS | UTC |
| 13 | 2 | -34 | 09:06 | -58 | 09:02 | 2 | 08:58 | 64 | 08:54 |
| 14 | 14 | 10 | 10:10 | 17 | 10:06 | -11 | 10:02 | -74 | *01:03 |

SERIES 5 DATA FILES WHICH PROVIDE TIME DIFFERENCES BETWEEN GPS OR LORAN CHAINS AND MC2 WILL STILL INCLUDE THE SAME DATA TABLE AND THE VALUES' FORMATS WILL REMAIN THE SAME. TABLES WILL CONTINUE TO APPEAR AS ILLUSTRATED BELOW. AGAIN, FOR BREVITY SAKE ONLY FOUR ROWS OF THE TABLE'S DATA ARE ILLUSTRATED. ALL VALUES BELOW ARE EXAMPLES VALUES.

| | | |
|------|------|----|
| GPS | -14 | 11 |
| 5930 | -120 | |
| 7960 | -10 | 10 |
| 7980 | 10 | |

7. TIME PROVIDED VIA INTERNET NETWORK TIME SERVER SITES USING THE NET WORK TIME PROTOCOL (NTP) IS NOT SENSITIVE TO Y2K. THESE SERVERS WILL CONTINUE TO PROVIDE 64 BIT FLOATING POINT TIME VALUES THAT REPRESENT THE NUMBER OF SECONDS SINCE THE START OF THE UNIX EPOCH. THIS DATA FORMAT IS VALID UNTIL 2037.

8. FORMAT OF EARTH ORIENTATION DATA PROVIDED BY THE IERS BULLETIN-A/N EOS EARTH ORIENTATION BULLETIN WILL NOT CHANGE. THIS BULLETIN WILL STILL PROVIDE THE SAME DATA TABLES AND EQUATIONS - COMBINED EARTH ORIENTATION PARAMETERS IERS RAPID SERVICE TABLE, EARTH ORIENTATION PREDICTION TABLE, AND

NEOS CELESTIAL POLE OFFSET SERIES TABLE, THESE TABLES' VALUES' FORMATS WILL REMAIN THE SAME.

THE COMBINED EARTH ORIENTATION PARAMETERS IERS PARID SERVICE TABLE WILL CONTINUE TO APPEAR AS ILLUSTRATED BELOW. ALL VALUES BELOW ARE EXAMPLE VALUES.

| | | | MJD | X | ERROR | Y | ERROR | UT1-UTC | ERROR |
|----|---|---|-------|--------|--------|--------|--------|----------|---------|
| | | | | " | " | " | " | S | S |
| 98 | 9 | 8 | 51064 | .08730 | .00005 | .46837 | .00005 | -.135544 | .000009 |
| 98 | 9 | 9 | 51065 | .08951 | .00005 | .46801 | .00005 | -.136971 | .000008 |

THE EARTH ORIENTATION DATA PREDICITIONS TABLE WILL CONTINUE TO APPEAR AS ILLUSTRATED BELOW. AGAIN, FOR BREVITY SAKE ONLY TWO ROWS OF THE TABLE'S DATA ARE ILLUSTRATED. ALL VALUES BELOW ARE EXAMPLE VALUES.

| | | | MJD | X(ARCSEC) | Y(ARCSEC) | UT1-UTC(SEC) |
|------|---|----|-------|-----------|-----------|--------------|
| 1998 | 9 | 10 | 51066 | .0915 | .4675 | -.13833 |
| 1998 | 9 | 11 | 51067 | .0934 | .4670 | -.13958 |

9. THIS MESSAGE WILL ALSO BE EMAILED ASAP TO NAVOBSY'S EXTENSIVE TIME AND EARTH ORIENTATION CUSTOMER MAILING LISTS. IT WILL ALSO BE POSTED TO THE USNO ASTROMETRY FORUM WEB PAGE. THIS MESSAGE AND FURTHER INFORMATION AND UPDATES REGARDING NAVOBSY'S Y2K COMPLIANCE STATUS CAN BE FOUND ON ITS WEB SITE LOCATED AT [HTTP://WWW.USNO.NAVY.MIL](http://www.usno.navy.mil). NAVOBSY'S POC FOR Y2K ISSUES IS LT B. HEINER, DSN 762-1537 OR COMM 202-762-1537//

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